

At-Risk Students at Traditional and Academic Alternative School Settings: Differences in Math and English Performance Indicators

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In this study, the researchers examined the extent to which at-risk students enrolled in traditional high schools differed in their state-mandated assessments in math and in English/Language Arts as compared to at-risk students enrolled in academic alternative education campuses (AECs). All data in this study were based on the accountability results reported by the Texas Education Agency for the 2004–2005 and 2005–2006 academic school years. Statistically significant differences were present between these two groups of students' math and English/Language Arts scores for the 2004–2005 and 2005–2006 school years. Students in traditional high schools with large at-risk populations had higher math and English/Language Arts scores than students served in AECs for both academic years examined. Implications of these findings are discussed.

Keywords: Assessment; Alternative education; At-risk students.

The term *at-risk* has become a catchall phrase to describe students who experience or who are predicted to experience failure during their schooling years. This term has been used traditionally by society as an arbitrary label for students who are likely to drop out of school because of undesirable educational experiences such as low academic achievement, poor school attendance, or grade retention (Johnson, 1997). Consequently, in theory, the term *at-risk* indicates a permanent psychoeducational condition that can be defined in unconditional terms (Ayers & Ford, 1996; Clayton, 1996). Researchers, however, have provided evidence that, in practice, the term is unclear and reflects a lack of consensus about its meaning and criteria (Donmoyer & Kos, 1993; Richardson, Casanova, Placier, & Guilfoyle, 1989). Based

upon empirical work, a variety of environmental, social, and cultural factors have been identified as being correlated with students being at-risk: (a) being a minority member or having an ethnic group identity; (b) living in a low socioeconomic household; (c) living in a single-parent family; (d) having a poorly educated mother; (e) having a non-English language background; (f) living in an impoverished neighborhood or community; and (g) living in a violent neighborhood or community (Lind, 1997; McDill, Natriello, & Pallas, 1985; Presseisen, 1988). As such, many of these attributes, in addition to others, are included in the various definitions used by state departments and schools in the United States to identify and to provide assistance to students identified as being at-risk.

One of the characteristic behaviors of students who are at-risk is dropping out of school prior to graduation. To address the problems of students leaving the traditional school system before completing high school, educators have developed many interventions to address the needs of at-risk students. One such intervention is the creation of academic alternative schools, based partly on the belief that when students are in nurturing and supportive environments, they are able to thrive academically (Frediana, 2002). Over the past 50 years, concerns among the public, educators, and policymakers about violent behavior, weapons, and drugs on school campuses, balanced with concern about sending troublesome and potentially dangerous students into the public as a result of expulsion, has precipitated an increased interest in alternative schools (U.S. Department of Education, 1996). Many students who have not had success in regular public schools have been sent to alternative placements. In general, students referred to alternative schools and programs are at-risk of educational failure as indicated by poor grades, truancy, disruptive behavior, suspension, pregnancy, or similar factors associated with early departure from school (Paglin & Fager, 1997).

During the 2000-2001 school year, 39% of U.S. public school districts administered at least one alternative school or program for at-risk students (NCES, 2002). In 2002, 11,000 alternative high schools served approximately 280,000 students who were at-risk of failing or dropping out of regular high school or who had been expelled from school (Escobar-Chaves, Tortolero, Kelder, & Kapadia, 2002; National Center for Education Statistics [NCES], 2003). Although disciplinary alternative schools are most common, alternative schools can be grouped in three categories based upon their proposed purposes: (a) magnet schools and schools of choice with programmatic themes and varied methods of instructional delivery; (b) schools with less emphasis on academics and more emphasis on behavior modifications; and (c) schools for students who need social or academic remediation programs (Lange, 1998; Raywid, 1999).

The phrase *alternative school* has often held a negative implication. In recent years, however, the phrase has suggested the opportunity for a second chance (McGee, 2001). This second chance option has combined the philosophies of alternative programs and school choice and offers another opportunity to students failing in the traditional system (Lange, 1998). These schools, which are focused on academics and high school completion, have been referred to as Academic Alternative Educational Campuses (AECs) and comprise instructional settings created to foster a positive learning climate featuring small class sizes, individualized assignments, self-paced timelines, competency-based rather than competition-driven performance assessments, and informal classroom interactions (Raywid, 1983). These

settings offer curriculum and instructional innovations to provide students the time needed to complete high school requirements and to provide teachers the continuous support required to implement such ambitious changes (Jordan, McPartland, Legters, & Balfanz, 2000). As such, AECs do not include disciplinary alternative schools or residential facilities.

Conceptual Framework

To understand the reasons that students may drop out of school and the rationale for AECs, Natriello, Pallas, and McDill's (1986) conceptual framework may be useful. Natriello et al. organized the factors related to students' decisions to complete school and grouped these factors by student characteristics and school processes. In this model, student characteristics and school processes interact to create a cumulative effect on students' development over the course of their school career. Depending upon individual experiences, students respond to these experiences and such responses result in consequences that determine students' educational future. Dropping out occurs because of the cumulative effect of negative experiences, both in factors that mold students' character and the school's failed attempts to meet the needs of at-risk students. Natriello et al. (1986) stated that if educators used this framework to develop methods that lessened the effects of risk factors and increased the awareness of educational alternatives, students would better be able to facilitate their long-term educational goals.

Druian and Butler (1987) used Natriello et al.'s (1986) framework in their study of effective schooling practices and at-risk youth. They questioned whether increased standards made it more difficult for at-risk students to succeed in school. When students were confronted with challenging standards, they were more likely to attend class and complete homework than when faced with less challenging standards. However, higher standards might have led to expectations that were too high for some students to succeed without additional assistance. As a result, academic separation occurred as failing students had fewer choices available to them. These negative conditions were related to students dropping out and harmful consequences associated with leaving school. The AECs, by design, were created to support students in the attainment of high standards and thus are supported by the concepts delineated in Natriello et al.'s model.

Rationale and Purpose

Specifically, in the state of Texas, 417 campuses were registered as AECs in 2006 (Texas Education Agency [TEA], 2006). One purpose of creating these alternative schools was to ensure that at-risk students graduate with a high school diploma. Over the past 20 years, the percent of dropouts in Texas has not changed much. In 1985–1986, Texas schools lost 33% of students as dropouts whereas in 2005–2006, Texas schools reported 35% as dropouts (Intercultural Development Research Association [IDRA], 2006). According to the IDRA's first study conducted in the 1980s, more than 2.5 million students exited from Texas public schools. This number, the equivalent of losing the populations of Austin, Dallas, and El Paso over the course of 2 decades, has cost the state \$730 billion in lost income, lost tax revenues, increased job training, welfare, unemployment, and criminal justice costs (Montecel-Robledo, 2005). Moreover, 35% of the high school freshman class of 2002–2003 in Texas left school before graduating in the 2005–2006 school year (Montecel-Robledo, 2005).

Texas educators have attempted to reduce the number of students dropping out of

school. As such, charter schools and academic alternative schools have been designed to offer nontraditional environments for at-risk students to complete their high school diplomas. However, little information is present in the research literature describing the academic success of at-risk students at AECs. Of concern is the extent to which these academic alternative high school settings are providing opportunities for students at-risk of dropping out and how at-risk students served in traditional high school settings fare compared to at-risk students served in academic alternative school settings. Thus, the purpose of this study was to determine if differences were present between the performance indicators of Texas high schools serving at-risk students in academic alternative settings compared to schools serving at-risk students in traditional high school settings.

Findings of this study may be used to guide the planning and implementation of alternative settings for at-risk students. Policy makers and various stakeholders concerned with high school graduation need information about the academic success of students enrolled in AECs. Given the lack of empirical studies in this area, our findings may assist in determining the extent to which AECs are accomplishing their academic goals in math and in English.

Research Questions

In this study, the researchers addressed the following questions: (a) What is the difference between student math performance at academic alternative high schools and at traditional high schools with large at-risk populations in the State of Texas for the 2004-2005 and for the 2005-2006 school years? and (b) What is the difference between student English/Language Arts performance at academic alternative high schools and at traditional high schools with large at-risk populations in the State of Texas for the 2004-2005 and for the 2005-2006 school years?

Method

Participants

In 2005, over 2 million students, 45.8% of the total number of students in the State of Texas, met the definition of at-risk (Texas Education Agency [TEA], 2005a). A comprehensive list of all high schools in Texas that fit the criterion of the study was obtained from TEA (TEA, 2005a). This list included academic alternative high schools in Texas as well as traditional high schools with 70% or larger at-risk populations. This percentage of at-risk students in traditional high schools was selected because academic alternative schools in Texas required an enrollment of at least 70% at-risk students for the academic years of 2004-2005 and 2005-2006 to be designated as an AEC (TEA, 2007).

Schools meeting the criteria of AECs in Texas in the school years 2004-2005 and 2005-2006 totaled 84. Data from these schools included student performance on the Exit Level Texas Assessment of Knowledge and Skills (TAKS) Math and the Exit Level TAKS English/Language Arts. Schools excluded from this study consisted of charter schools, residential facilities, and discipline alternative schools because they did not meet the criteria of academic AECs. Schools meeting the criteria of traditional high schools with large at-risk populations for the school year 2004-2005 and 2005-2006 in the State of Texas totaled 86.

Instrumentation

Archival information was acquired from the Academic Excellence Indicator System (AEIS) on each school in the State of Texas that met the criteria of the study for the school years 2004–2005 and 2005–2006. Data were obtained from the AEIS database, which provides a broad range of school-level and district-level information on the performance indicators of public schools in Texas on an annual basis. The collected data for this study focused on the performance indicators of Math and English/Language Arts of schools serving at-risk students in AECs compared to schools serving large at-risk populations in traditional high school settings.

Dependent Variables

Exit Level TAKS Math and English/Language Arts Examinations. The TAKS, a comprehensive testing program for public school students in grades 3–11 (TEA, 2006), is designed to measure to what extent a student has learned, understood, and is able to apply the important concepts and skills expected at each tested grade level and subject area tested. Reliability of the TAKS score is based on internal consistency measures utilizing the Kuder-Richardson Formula 20. Most internal consistency reliabilities are in the high .80s to low .90s range with score reliability for TAKS ranging from 0.81 to 0.93 (TEA, 2006). Thus, sufficient reliability exists for math and for English/Language Arts tests scores for research purposes.

Independent Variable

Academic Alternative Campus (AEC). The AECs are instructional settings created to foster a positive learning climate featuring small class sizes, individualized assignments and self-paced timelines, competency-based rather than competition-driven performance assessments, and informal classroom interactions (Raywid, 1983). These settings offer curriculum and instructional innovations to provide students the time and help for success in a high standards program. In AECs, faculty members are provided support and training to work with at-risk populations (Jordan et al., 2000). The AEC school settings in Texas that were excluded from this study were charter schools, residential placement facilities, and discipline alternative schools because they did not meet the criteria of AECs targeted for this study.

Traditional high school setting. A traditional high school setting was defined as a regular high school that was state accredited and followed the accountability guidelines set by the AEIS. For this study, only high schools with large at-risk populations were selected, specifically Texas high schools that had 70% or greater at-risk students. To compare the AECs to traditional high schools, this 70% or higher at-risk population criterion was used because AECs in Texas had to have at least 70% at-risk populations to be considered an AEC.

Procedures

All data in this study were based upon the accountability data reported by TEA for the 2004-2005 and 2005-2006 school year. Data were collected from archival information maintained by TEA and accessible from the TEA website. The AEIS report from each school

identified in the sample was accessed, and data points were collected and entered in to a spreadsheet. Performance indicators selected for this study were the Exit Level Texas Assessment of Knowledge and Skills (TAKS) in Math and in English/Language Arts.

Only data from traditional high schools with at-risk populations of 70% or larger ($n = 86$) and AECs ($n = 84$) were used in the data analysis. The AEIS database is not always comprehensive and therefore, some indicators were not reported for some schools. However, all data that were available from AEIS were utilized for the statistical analysis of the selected schools.

Results

For each of the research questions, the dependent variables were the Exit Level TAKS Math scores and the Exit Level TAKS English/Language Arts scores for the academic years 2004-2005 and 2005-2006. The independent variable was the school setting which included academic alternative high schools and traditional high schools with large at-risk populations. An assessment of the standardized skewness coefficients (Table 1) for both settings for both years revealed serious departures from normality. For example, the standardized skewness coefficient for the English/Language Arts TAKS Exit Level test scores for 2004–2005 (i.e., the skewness value divided by the standard error of the skewness value) was -7.35 (i.e., $-1.61 / 0.22$). This index indicated a markedly negative skew (Onwuegbuzie & Daniel, 2002). Also, the standardized kurtosis coefficient (i.e., the kurtosis value divided by the standard error of the kurtosis value) was 6.03 (i.e., $2.63 / 0.44$). This value indicated a leptokurtic distribution, characterized by a distributional shape that was more peaked than the normal distribution (Onwuegbuzie & Daniel, 2002). After this analysis, it was determined that parametric statistical analyses were inappropriate because of these indicators of non-normality. Thus, a nonparametric (i.e., Mann-Whitney's U) t -test was calculated to examine each of the research questions. Also reported in the data analysis is the Z score, which indicates how far, and in what direction, each item deviates from its mean, expressed in units of its standard deviation.

Table 1. Descriptive Statistics for Variables by School Year for Both Settings

Variables	n	M	SD	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
2004-2005					
Math	126	60	18.11	-4.51	.82
English/Language Arts	122	74.84	15.25	-7.35	6.03
2005-2006					
Math	130	56.31	18.57	-4.51	1.25
English/Language Arts	128	74.54	12.62	-7.51	-10.42

For the 2004-2005 academic year, descriptive statistics for each of the variables for the traditional high schools and the academic alternative schools used in this study are listed in Table 2. For the 2005-2006 academic year, descriptive statistics for each of the variables for the traditional high schools and AECs examined in the study are listed in Table 3.

Table 2. Descriptive Statistics for 2005–2006 Variables by School Settings

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Traditional Schools					
Math	86	63.57	11.12	-6.80	18.61
English/Language Arts	86	77.72	8.35	-1.54	1.29
AECs					
Math	44	42.02	21.12	.87	1.14
English/Language Arts	42	68.50	17.10	-3.00	1.80

Table 3. Descriptive Statistics for 2004–2005 Variables by School Settings

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	Standardized Skewness Coefficient	Standardized Kurtosis Coefficient
Traditional Schools					
Math	86	66.04	11.12	-3.75	6.62
English/Language Arts	85	78.82	8.08	-3.11	2.24
AECs					
Math	40	47.00	22.97	0.50	-1.69
English/Language Arts	37	65.70	22.49	-1.25	-1.29

A Bonferroni correction was used because multiple outcome measures were analyzed. Without adjusting for increased error due to multiple uses of the same statistical procedure on the same sample, this type of analysis is more likely to result in a Type I error. The Bonferroni correction is a method that allows many comparison statements to be made (or confidence intervals to be constructed) at the same time assuring an overall confidence

coefficient is maintained. The Bonferroni correction, using an adjusted alpha level equal to the original alpha level (.05), was divided by the number of the outcome measures (four) as described in the research questions (Brown & Russell, 1997). This correction was undertaken by dividing the nominal alpha value by 4 (i.e., $.05/4 = .0125$), resulting in an adjusted level of statistical significance was .0125.

Results

To determine whether a statistically significant difference was present between the Exit Level Math TAKS scores of traditional high schools with large at-risk populations and academic alternative high schools in Texas for the school year 2004–2005, a nonparametric (i.e., Mann-Whitney's U) *t*-test was calculated for each of the two academic years, with school setting being the variable under investigation. For the 2004-2005 academic year, the finding ($U = 916.50, p < .001$) was statistically significant. At-risk students in the traditional high school setting with large at-risk populations performed significantly higher than at-risk students in academic alternative schools. The *Z* score (-4.21) confirmed this statistically significant finding reflecting a mean score ($M = 66.05$) of more than six standard deviations ($SD = 11.12$) below the mean. Using a 99.4% confidence interval, Cohen's (1988) *d* (1.05), as reported in Table 2, represented a large effect size.

To determine whether a statistically significant difference was present between the Exit Level Math TAKS scores of traditional high schools with large at-risk populations and academic alternative high schools in Texas for the school year 2005-2006, a Mann-Whitney U was calculated. Similar to the previous academic year, for the 2005-2006 academic year, a statistically significant difference was present ($U = 741.59, p < .001$). Thus, the Exit Level Math TAKS scores were clearly different in the school settings studied in Texas for the two years of data examined. At-risk students in the traditional high school setting with large at-risk populations performed significantly higher in math than at-risk students in academic alternative schools. The *Z* score (-5.66) confirmed this statistically significant finding reflecting a mean score ($M = 63.57$) of more than five standard deviations ($SD = 11.88$) below the mean. Using a 99.4% confidence interval, Cohen's *d* (1.21), as reported in Table 2, represented a large effect size (Cohen, 1988).

To determine whether a statistically significant difference was present between Exit Level English/LA scores of traditional high schools with large at-risk populations and academic alternative high schools in the State of Texas for the school year 2004-2005, a Mann-Whitney U was calculated for each of the two academic years, with school setting being the variable under investigation. For the 2004-2005 academic year, the finding ($U = 1118.00, p = .011$) was statistically significant. At-risk students in the traditional high school setting with large at-risk populations performed significantly higher than at-risk students in academic alternative schools. The *Z* score (-2.33) confirmed this statistically significant finding reflecting a mean score ($M = 78.82$) of more than two standard deviations ($SD = 8.10$) below the mean. Using a 99.4% confidence interval, Cohen's *d* (0.78), as reported in Table 3, represented a moderate effect size (Cohen, 1988).

To determine whether a statistically significant difference was present between the Exit Level English/LA scores of traditional high schools with large at-risk populations and academic alternative high schools in Texas for the 2005-2006 school year, a Mann-Whitney

U was calculated. The result, $U = 1189.50$, $p < .001$, was statistically significant, indicating that at-risk students in the traditional high school setting with large at-risk populations performed significantly higher than at-risk students in academic alternative schools. The Z score (-2.62) confirmed this statistically significant finding reflecting a mean score ($M = 77.52$) of more than two standard deviations ($SD = 8.35$) below the mean. Using a 99.4% confidence interval, Cohen's d (0.67), as reported in Table 3, represented a moderate effect size (Cohen, 1988).

Discussion

Scores of students in traditional high schools with large at-risk populations were statistically significantly higher than scores of students served in AECs. These differences existed for both exit-level examinations in math and in English/Language Arts and were present in both academic years examined. Several points of discussion exist regarding the statistically significant differences present in the scores on Exit TAKS examinations in Math and English/Language Arts for at-risk students at traditional high schools and those students served at AECs. The first point addresses the identification criteria for at-risk students. Students in AECs may have multiple risk factors as compared to students attending traditional high school. In Texas, 13 possible indicators are used to identify students as at-risk (TEA, 2005a). It is possible that a student could be classified as at-risk when meeting one criterion, and another student, also identified as being at-risk, has several at-risk factors. For example, a student could be identified as at-risk because he or she failed one portion of the TAKS test, however, another student could be identified as at-risk because he or she failed all portions of the TAKS, is a parent, had been retained at some point, and has limited English proficiency. Both students meet the criteria for being identified as at-risk, yet one student has many more academic and/or psychosocial issues than the other. The current definition of at-risk in Texas does not differentiate the degree of need, which might be critical in properly serving these students. A difference could also exist in the needs of students who are served in AECs due to the multiplicity of reasons that these students are at-risk. At-risk students who are served in traditional high schools, most likely, meet fewer criteria of the at-risk definition than students who are served in AECs, which might explain the differences present in this study regarding TAKS Math and English/Language Arts performance.

Another possible reason for the differences in the performance of the at-risk students and traditional high school students could exist in the peer groups in each setting. Large, traditional high schools are comprised of heterogeneous groups of students whereas the AECs are comprised of more homogenous groups of students. Most students at AECs are critically at-risk of dropping out of school due to academic and psychosocial issues that have affected their school performance. Thus, students at AECs might not be as focused, as motivated, or as challenged as students in traditional high school settings. Because AECs may have more homogeneous populations, positive peer influence and role modeling might be lacking.

Finally, the state accountability systems for traditional high schools and AECs are different. The requirements for AECs to be rated as *Acceptable* are to have at least a 45% passing rate of all TAKS tests taken, summed across grades and subjects whereas the requirements for traditional high schools are 70% of all students in all demographic

categories have to pass all subject areas of TAKS for the school to achieve an *Acceptable* rating (TEA, 2005b). This higher accountability standard could influence teacher and principal expectations at AECs. Perhaps lower teacher/principal expectations are present at AECs because of the accountability system differences between the two settings. Therefore, lower scores on Exit Level Math and English/Language Arts TAKS examinations may result at AECs due to the state accountability system that perpetuates these results by requiring lower standards for AECs.

Implications

To the extent that these findings are generalizable, implications exist for stakeholders who work with at-risk students in both educational settings. These researchers focused on specific indicators of performance of at-risk students in AECs and traditional high schools with large at-risk populations. In examining the differences revealed in each setting, traditional high schools may be a viable option for school districts striving to meet the needs of at-risk students and to ensure their school completion. Even so, a need exists to redefine at-risk criteria and consider categorizing the criteria in terms of academic and/or psychosocial factors. The current criteria, ineffective due to the vagueness and ambiguity of the current definition, could be redefined to help schools of all settings better identify students. Moreover, service options for students with multiple at-risk criteria could be developed if identification methods were more specific.

Based upon this research, recommendations for practitioners include changing the definition of at-risk and categorizing factors by academic and/or psychosocial descriptors. Redefining and clarifying the definition could result in more effective interventions and improved completion rates for students served in both settings. Further studies are needed to identify the effects of interventions specific to academic issues associated with being at-risk for dropping out of school and psychosocial reasons for being at-risk. Qualitative studies in which the expectations and efficacy beliefs of teachers of at-risk students in both traditional high schools and academic AECs are explored could yield important information about teacher behaviors that help students succeed.

Additional understanding is needed to improve the academic performance of at-risk students. Further research could identify and describe schools with the highest percentages of at-risk students who also have high graduation and completion rates and low dropout rates. Such research could identify strategies to improve the services for at-risk students in both settings.

Other studies might be conducted to describe the characteristics of students who choose to attend an academic alternative school. This investigation would offer insight for both traditional school and academic AEC administrators and teachers. The results of such a study might indicate other reasons for enrolling in an AEC, which would enable educators at traditional high schools to address better the psychosocial needs of at-risk students. Because relatively little has been studied about the effects of school setting concerning the success of at-risk students, this work may provide additional information to a growing base of knowledge about serving at-risk students.

Although statistically significant differences were revealed in the academic performance of students in traditional high schools as compared to those at-risk students served in AECs, some limitations are warranted. First, the data analyzed were summed data

at the school level. As such, these data represent averages of students' performances and not any single student's individual performance. When data are aggregated prior to analyses, important information about individuals may be lost. Second, included in the aggregated school-level data at the traditional high schools were aggregated test scores from students who were not identified as being at-risk. It is possible that the academic performance of these students resulted in some of the difference in academic performance between the two types of schools. Third, the definition of at-risk poses limitations in that it was not possible to determine the number of at-risk indicators of students served in either setting. As such, a student with multiple at-risk factors may score differently than a student with only one at-risk factor. Fourth, the sample size of schools whose aggregated data were analyzed in this study was relatively small for both types of schools. Though the findings were consistent across both years of data analyzed, it is possible that different results might have been obtained if data from larger numbers of each type of school had been available for analysis.

Until such time as these findings are replicated in additional studies, readers are urged to be cautious in any generalizations they make from this study. These findings should be viewed as tentative in nature and limited to schools in Texas similar in nature to the types of schools described herein. We believe that this study is an initial step in exploring the extent to which AECs are successful in accomplishing their academic goals.

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